



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – ZOOLOGY & PLANT BIOLOGY

THIRD SEMESTER – NOVEMBER 2017

CH 3102 - CHEMISTRY FOR BIOLOGISTS - THEORY

Date: 11-09-2017
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 × 2= 20)

1. Define lattice energy. Mention its significance in the formation of ionic compounds.
2. What is meant by dipole-dipole interaction?
3. Define ionic product of water.
4. Calculate the pH of 0.001 M hydrochloric acid.
5. Give an example for a heterogeneous catalytic reaction.
6. What are lyophobic colloids? Give an example.
7. Mention any two applications of colloids.
8. Why is trichloroacetic acid more acidic than acetic acid?
9. Draw the structures of maleic and fumaric acids. Name the isomerism exhibited by them.
10. Write the hybridization and geometry of methane molecule.

Part-B

Answer any EIGHT questions.

(8 × 5= 40)

11. Discuss the structure and function of hemoglobin.
12. Distinguish between primary and secondary valencies of a metal atom.
13. Explain inter and intramolecular hydrogen bonding with relevant examples.
14. Write the requirements of a primary standard.
- 15a. How will you prepare 500 ml of 0.02 N sodium hydroxide solution?
(Equivalent weight of NaOH = 40)
- b. Define the term mole fraction. **(3+2)**
16. Derive the rate constant expression for a first order reaction.
17. Tabulate the differences between order and molecularity of a reaction.
18. Explain electrophoresis with a neat diagram.
19. Discuss the classification of polymers with suitable examples.
20. Explain the optical isomerism exhibited by tartaric acid.
21. Explain any two methods of separation of racemic mixture.
22. Explain addition and condensation polymerization reactions with an example for each.

Part-C

Answer any FOUR questions.

(4 × 10= 40)

- 23a. Discuss the theory of hydrogen bonding.
- b. Explain the crystal structure of sodium chloride. **(5+5)**
- 24a. Predict the hybridisation and geometry of NH₃ and H₂O molecules based on VSEPR theory.
- b. Explain the geometrical isomerism exhibited by square planar complexes. **(6+4)**
- 25a. What are buffer solutions? Explain the mechanism of buffer action of acidic buffers with an example.
- b. State the principle of volumetric analysis. **(8+2)**
- 26a. Derive Michaelis-Menten equation.
- b. Write a note on the enzymes used in industries. **(6+4)**
27. Explain the kinetic and optical properties of colloids in detail.
28. How are the following polymers manufactured? Mention any one use of them.
a) Nylon 6,6 b) Teflon c) Thiokol **(4+3+3)**